Safety Edge

Brian K. Mayhew, PE, CPM

November 6, 2012

Summary of North Carolina's experience with Safety Edge.

North Carolina Implementations

Pilot Projects Implemented over the Last Several Years

- Completed 5 sections (20 miles) from 2008 through 2010
- Johnston County Pilot – 8 sections (10 miles) in early 2011
- Completed additional 66 sections (130 miles) in rest of 2011
- 2011 and 2012 – 40% (150 contracts) of all centrally let resurfacing projects required shoulder wedge
- Starting January 2013 – Require the use of shoulder wedge on all contract resurfacing projects (Central and Division Let)

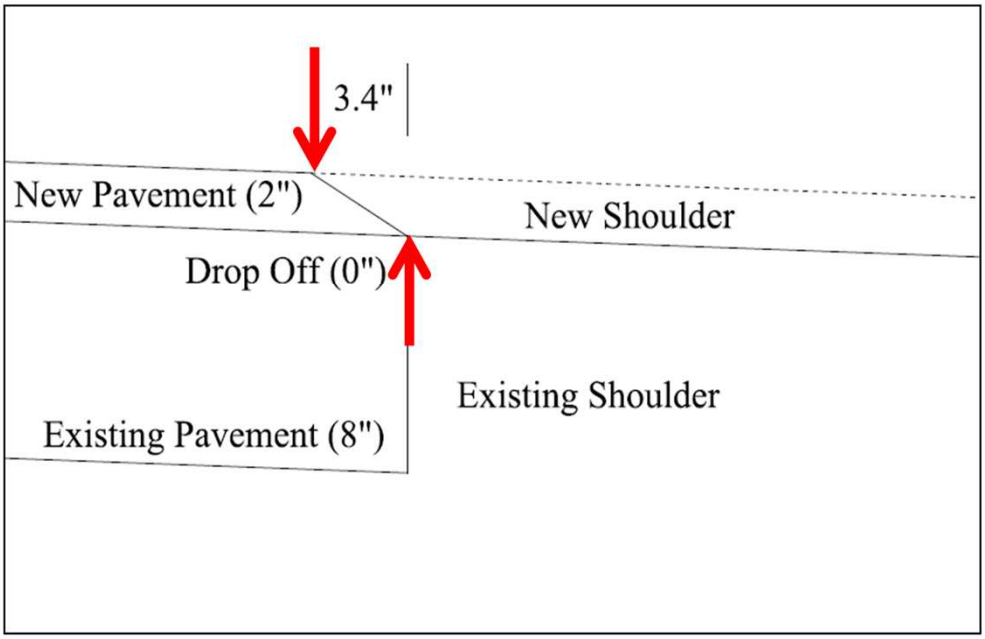
In NC from 2008 through 2010 there have been five routes completed with Safety Edge for a total of approximately 20 miles.

The Johnston County Pilot Project adds 8 routes for approximately 10 miles of Safety Edge that was installed in March 2011 to April 2011.

There were multiple routes in Division 6 and Division 13 that implemented Safety Edge this year, 66 routes for a total of approximately 130 miles.

Cross Section Options

Cross Section 1 – Effectively Reduces Cross-Sectional Width

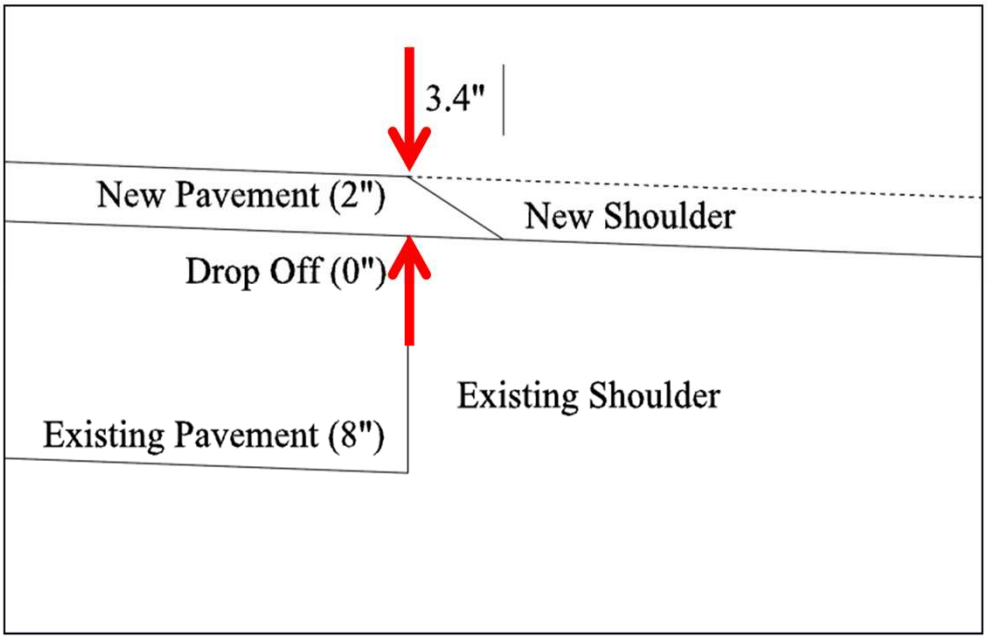


The Cross Section 1 above represents when the toe of the wedge is placed at the old edge of pavement and the breakpoint of the wedge is 3 to 5 inches in from the old edge of pavement (distance dependent on the thickness of the lift). This places the entire edge shape over existing pavement **which effectively reduces the existing cross-sectional width of the new pavement lift**.

Cross Section 1 represents what North Carolina did in some of the 2008 through 2010 projects.

Cross Section Options

Cross Section 2 – Cross-Sectional Width Remains the Same

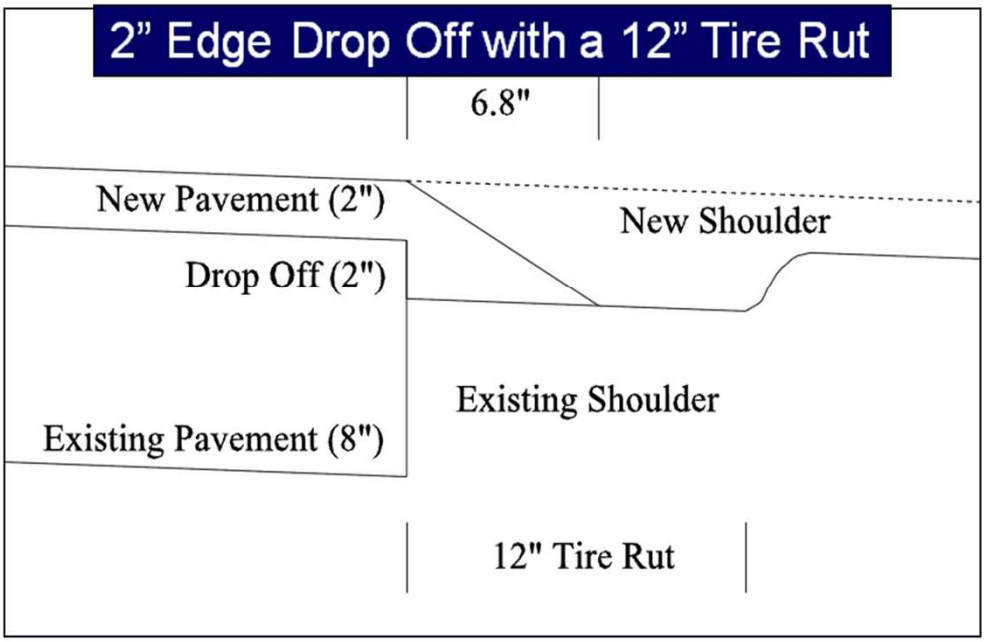


The Cross Section 2 above represents when the breakpoint of the wedge is placed at the old edge of pavement and the toe of the wedge is 3 to 5 inches out from the old edge of pavement (distance dependent on the thickness of the lift). This places the entire edge shape over soil **which effectively keeps the existing cross-sectional width the same on the new pavement lift as the old pavement lift**.

Cross Section 2 represents 90 percent of what North Carolina did in the 2011 Projects.

Cross Section Options

Cross Section 2 – Cross-Sectional Width Remains the Same

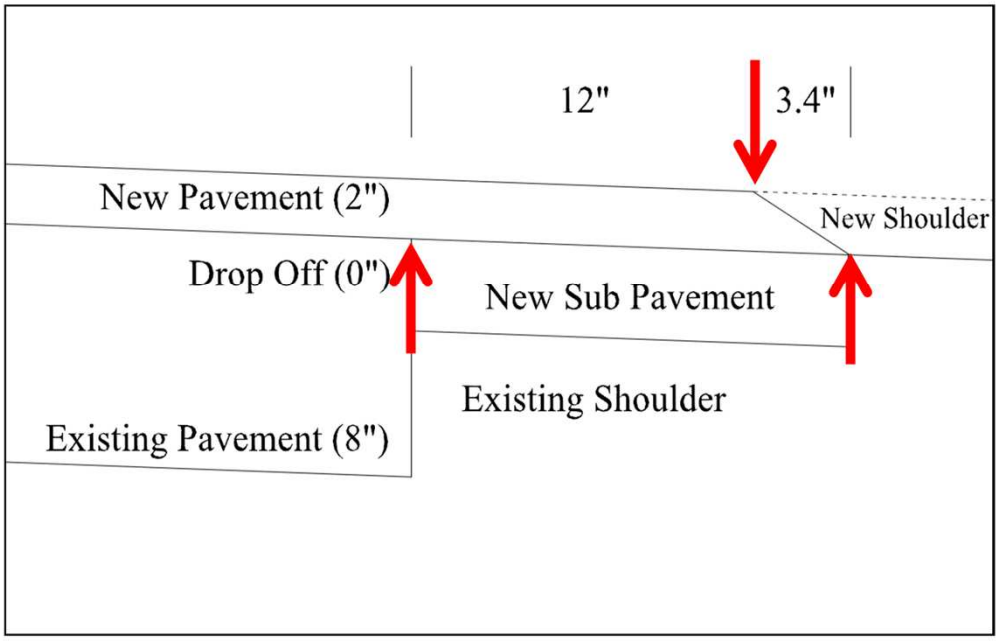


The Cross Section 2 above represents when the breakpoint of the wedge is placed at the old edge of pavement and the toe of the wedge is 3 to 5 inches out from the old edge of pavement (distance dependent on the thickness of the lift). This places the entire edge shape over soil which effectively keeps the existing cross-sectional width the same on the new pavement lift as the old pavement lift.

This slide represents what would occur if there was an existing 4 inch edge drop-off. The edge would extend out an additional 6.8 inches on a 2 inch lift (distance is increase from 3.4 inch increase when there is no edge drop off). Keep in mind that the edge devices make a safety edge shape that is 6 to 9 inches wide (dependent on device). For this example of a 10.2 inch safety edge shape (from a 4 inch edge drop-off), the 9 inch safety edge device would only make the shape for the first 9 inches after the edge breakpoint, then the asphalt would fall off as usual. This will be demonstrated in multiple photos throughout this section.

Cross Section Options

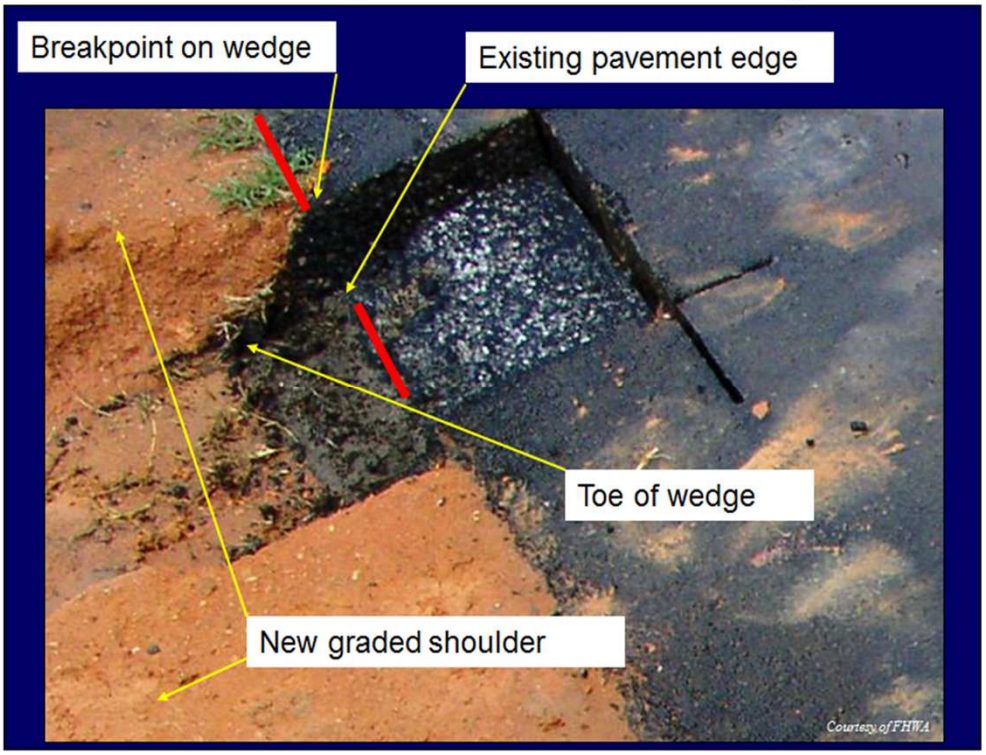
Cross Section 3 – Effectively Increases Cross-Sectional Width



The Cross Section 3 above represents when the toe of the wedge is placed at the edge of the new sub pavement and the breakpoint of the wedge is 3 to 5 inches in from the edge of the new sub pavement (distance dependent on the thickness of the lift). This places the entire edge shape over new sub pavement which effectively increases the existing cross-sectional width of the new pavement lift (distance dependent on the amount of paved shoulder increase within the specific project).

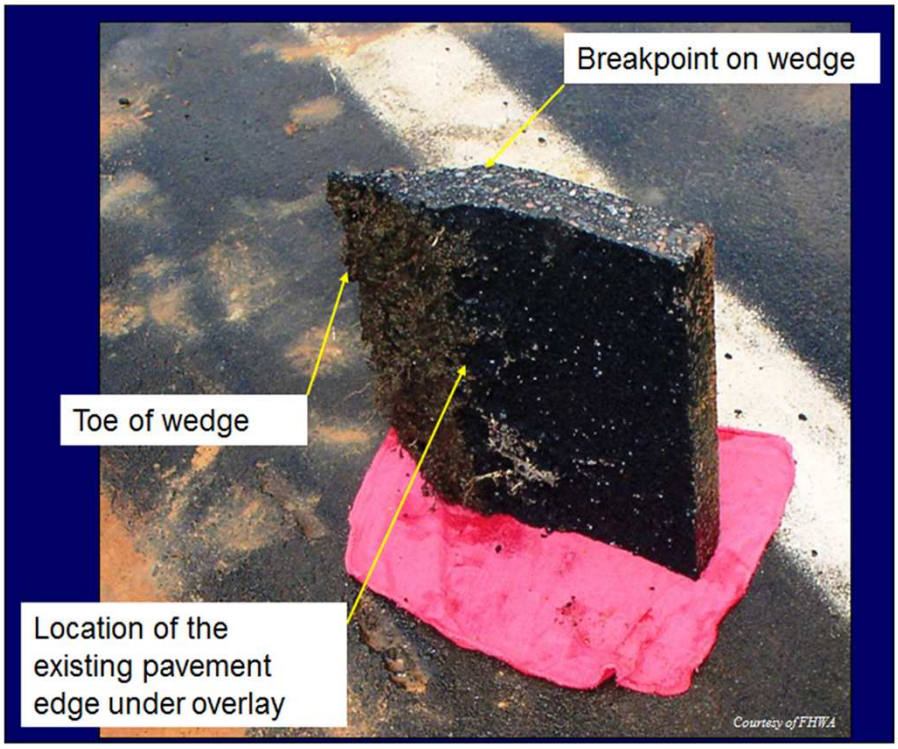
Cross Section 3 represents 10 percent of what North Carolina did in the 2011 Projects.

Cross Section Option 2 - Example



Cross Section 2 Example from Georgia Installation. Edge was placed on dirt.

Cross Section Option 2 - Example



Cross Section 2 Example from Georgia Installation. Edge was placed on dirt.

Picture on left is from third Johnston County Pilot Project Implementation where the asphalt trucks had to drive around the Paver shortly after this section of roadways Safety Edge was laid. Photo on right is from Georgia installation. Both of these edges were placed on dirt.

Cross Section Option 2 - Examples

North Carolina Implementations

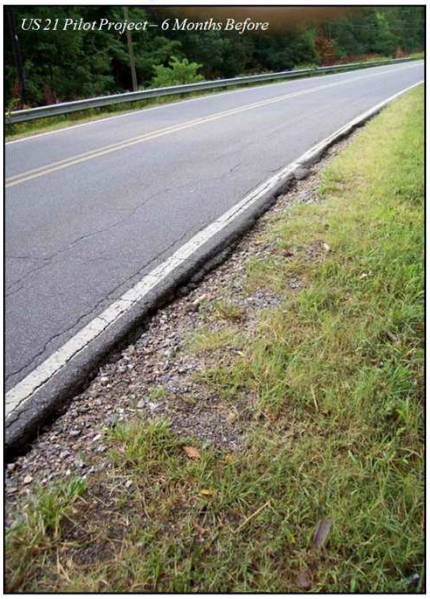
- Proven durability under heavy truck usage from three (3) year observational analysis of an ~8 mile section of road (US 21)

These photos represent the three (3) year after observation of the Safety Edge installation on US 21.

Cross Section Option 2 - Example

North Carolina Implementations

- Where shoulder rutting occurred prior to resurfacing, the same shoulder rutting occurred after resurfacing with the safety edge



This location is an example of where shoulder rutting existed six (6) months prior to the resurfacing job (right). The left photo shows the same location re-rutted one and one half (1.5) years after the resurfacing job.

N.C. Department of Transportation Safety Edge

Cross Section Option 2 - Example

North Carolina Implementations

This location is an example of where the shoulders were pulled back one (1) month after Safety Edge implementation and how the same edge looked at the six (6) month observation. This specific curve was heavily rutted out prior to the resurfacing.

N.C. Department of Transportation Safety Edge

Cross Section Option 2 - Example

North Carolina Implementations

One (1) Year After Observation.

N.C. Department of Transportation

Safety Edge

Cross Section Option 2 - Example

North Carolina Implementations

Six (6) Month After Observation.

N.C. Department of Transportation

Safety Edge

Cross Section Option 2 - Example

North Carolina Implementations

One (1) Year After Observation.

N.C. Department of Transportation

Safety Edge

Cross Section Option 2 - Example

North Carolina Implementations

Six (6) Month After Observation.

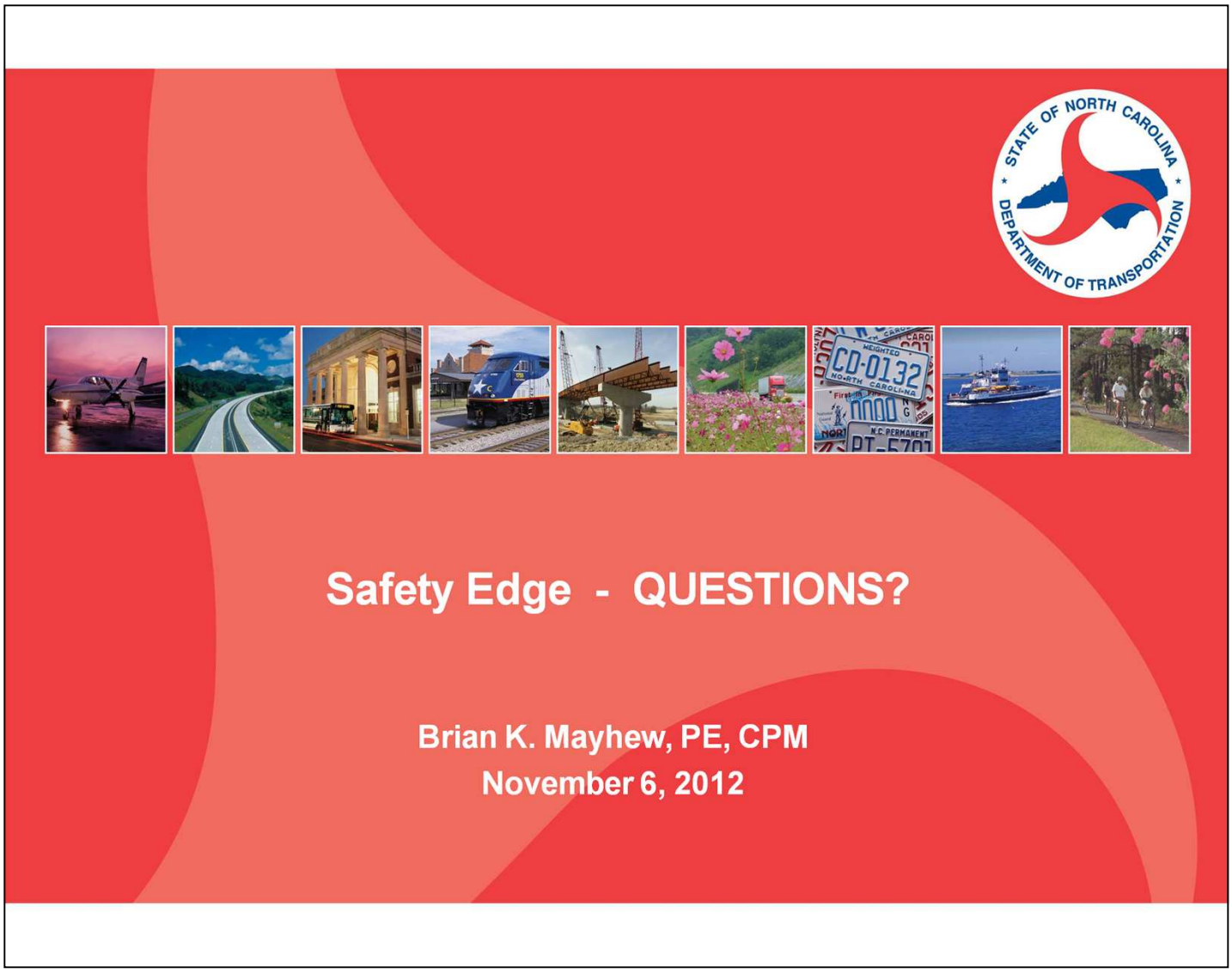
N.C. Department of Transportation

Safety Edge

Cross Section Option 2 - Example

North Carolina Implementations

One (1) Year After Observation.



Summary of North Carolina's experience with Safety Edge.